

SWOT INSTITUTE
PROBABILITY
XII-TEST

Time : 1 hr.

1. A die is thrown three times, Events A and B are defined as below :
A : 4 on the third thrown.
B : 6 on the first and 5 on the second throw.
Find the probability of A given that B has already occurred.
2. Bag I contains 3 red and 4 black balls while another Bag II contains 5 red and 6 black balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that it was drawn from Bag II.
3. Given three identical boxes I, II and III, each containing two coins. In box I, both coins are gold coins, in box II, both are silver coins and in the box III, there is one gold and one silver coin. A person choose a box at random and takes out a coin. If the coin is of gold, what is the probability that the other coin in the box is also of gold ?
4. In a factory which manufactures bolts, machines A , B and C manufacture respectively 25%, 35% and 40% of the bolts. Of their outputs, 5, 4 and 2 percent are respectively defected bolts. A bolts is drawn at random from the product and is found to be defective. What is the probability that it is manufactured by the machine B ?
5. A man is known to speak truth 3 out of 4 times. He throws a die and reports that is a six. Find the probability that is actually a six. Find the probability that it is actually a six.
6. In answering a question on a multiple choice test, a student either knows the answer of guesses. Let $\frac{3}{4}$ be the probability that he knows the answer and $\frac{1}{4}$ be the probability that he guesses. Assuming that a student who guesses at the answer will be correct with probability $\frac{1}{4}$.
What is the probability that the student know the answer given that he answered it correctly ?
7. Find the probability distribution of number of doublets in three throws of a pair of dice.
8. Let X denote the number of hours you study during a randomly selected school day. The probability that X can take the values x, has the following form, where k is the some unknown constant.
$$P(X = x) = \begin{cases} 0.1, & \text{if } x = 0 \\ kx, & \text{if } x = 1 \text{ or } 2 \\ k(5 - x), & \text{if } x = 3 \text{ or } 4 \\ 0, & \text{otherwise} \end{cases}$$
 - (a) Find the value of k.
 - (b) What is the probability that you study at east two hours ? Explain tow hours? At most tow hours ?
9. Let a pair of dice be thrown and the random variable X be the sum of the numbers that appear on the two dice. Find the mean or expectation of X.
10. If a fair coin is tossed 10 times, find the probability of
(a) exactly six heads (b) at least six heads (c) at most six heads.
11. Ten eggs are drawn successively with replacement from a lot containing 10% defective eggs. Find the probability that there is at least one defective egg.
12. There are 5% defective item in a large bulk of items. What is the probability that a simple of 10 items will include not more than one defective item ?
13. Five cards are drawn successively with replacement from a well-shuffled deck of 52 cards. What is the probability that
(a) all the five cards are spades ? (b) only 3 cards are spades ? (c) none is a spade ?